REMARKS

I. Status of the Claims:

Claims 37-61 are pending in this application.

By this Amendment, claims 41-47 have been canceled without prejudice or disclaimer and claim 37 has been amended. Upon entry of the Amendment, claims 37-40 and 48-61 would be pending. No new matter is believed to have been introduced by this Amendment. Entry of this Amendment before examination on the merits is respectfully requested.

II. Rejections under 35 U.S.C. § 103:

Claims 37-41, 44-46, 48-55, 57, 58 and 60 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Arimoto et al. (US 5,371,613) in view of Orito (US 6,072,912) and Sawada (US 5,912,992). Claims 42-43, 47 and 56 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Arimoto et al. in view of Orito, Sawada and Irie (US 5,644,409) Claims 59 and 61 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Arimoto et al. in view of Orito, Sawada and Usami (US 5,960,110).

Claim 37 is directed to an arrangement including: (1) an image sensor which separately reads out image signals from a plurality of photoreceptive pixels via a plurality of output channels; (2) a reference level acquisition unit adapted to acquire a first reference level based on the image signals output from the output channels when the image sensor reads a white member, and acquire a second reference level based on the image signals output from the output channels when the image sensor reads a reference density member having a predetermined density of half tone; and (3) a plurality of adjustment units, respectively corresponding to the

plurality of output channels, each adapted to adjust levels of the image signals output from the output channels so as to substantially correspond with the first reference level when the image sensor reads the white member, adjust levels of the image output from the output channels so as to substantially correspond with the second reference level when the image sensor reads the reference density member, and adjust levels of the image signals output from the output channels so as to substantially correspond with a level obtained by interpolating between the first and second reference levels when the image sensor reads an image having a density other than the density of the white member and the reference density member. The first reference level is a maximum of signal levels read out via the plurality of output channels when the white member is scanned, and the second reference level is a minimum of signal levels read out via the plurality of output channels when the reference density member is scanned.

The claimed arrangement, as noted above, relates to an image sensor which separately reads out image signals via a plurality of output channels, and is aimed for instance at adjusting linearity between the image signals read out via the plurality of output channels using LUTs so as to prevent the level gap between the read image signals due to the characteristics difference between the channels.

For example, upon adjusting the signal levels read out via the plurality of output channels, if a LUT is set such that the maximum level (saturation level) of a signal from any of the channels after LUT conversion is smaller than the maximum level (saturation level) of the signal before LUT conversion, there will be a case in which, when a white document is read, white levels between channels after LUT conversion differ from each other as shown in Fig. 12. Therefore, the LUTs are set so that the maximum levels (saturation level) of the signals from the plurality of channels after LUT conversion do not become smaller than the maximum levels

(saturation level) of the signals before LUT conversion. See the Application, p. 28, lines 3-21. Further, the levels between the signals read out via the respective channels after LUT conversion should match to each other when a solid-color object is scanned.

Accordingly, in this example, the white reference level W (corresponds to "first reference level" in claims) is set to the maximum of W1 to W4, and the gray reference level G (corresponds to "second reference level" in claims) is set to the minimum of G1 to G4. By setting the first and second reference levels in this manner, the maximum levels of signals after LUT conversion never become smaller than the maximum levels of signals before LUT conversion. See e.g., the Application, p. 29, lines 5-13.

In contrast, Arimoto, Orito, and Sawada, individually or in combination, do not disclose or suggest "said first reference level is a maximum of signal levels read out via the plurality of output channels when said white member is scanned, and said second reference level is a minimum of signal levels read out via the plurality of output channels when said reference density member is scanned" as claimed.

The remaining cited reference Irie discloses to correct shading data as a countermeasure to a case where the white reference plate 24 becomes dirty and proper shading correction can not be performed. In Irie, the line CCD 26 outputs image data obtained by scanning the reference plate 24 via a single output channel, and there is no teaching or suggestion about setting any of the reference values to the maximum and minimum of the signals read out via a plurality of output channels. Furthermore, it is respectfully noted that shading correction for correcting nonuniformity in illumination of a light source for reading (Irie, column 1, lines 13-17) and correcting the signal levels so as to match the linearity between a plurality of output channels (as in the present claimed arrangement) belong to two different techniques.

Therefore, the combination of Arimoto, Orito, Sawada, and Irie does not assure that the maximum levels of signals after LUT conversion do not become smaller than the maximum levels of signals before LUT conversion, and white level difference may occur between channels.

In view of the foregoing, Arimoto, Orito, Sawada, and Irie, individually or in combination, do not teach, suggest, or otherwise render obvious the arrangement of claim 37 and its dependent claims.

CONCLUSION

Based on the foregoing amendments and remarks, the Applicant respectfully requests reconsideration and withdrawal of the rejection of claims and allowance of this application.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. 13-4500, Order No. 1232-4676.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 1232-4676.

Respectfully submitted,
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Dated: 8/28/06 By: _____

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